

REMARKS/ARGUMENTS

Amendments were made to the specification to correct the error noted by the Examiner and an error noted by Applicants. No new matter has been added by any of the amendments to the specification.

Claims 1-20 are pending in the present application. Claims 1, 7, 13 and 19 were amended to ensure proper antecedent basis for all terminology therein. No claims have been added or canceled. Applicants have carefully considered the cited art and the Examiner's comments, and believe claims 1-20 patentably distinguish over the cited art and are allowable in their present form. Reconsideration of the rejection is, accordingly, respectfully requested in view of the above amendments and the following comments.

I. 35 U.S.C. § 101: Claims 19-20

The Examiner has rejected claims 19-20 under 35 U.S.C. § 101 as being directed towards non-statutory subject matter. This rejection is respectfully traversed.

In rejecting the claims, the Examiner states:

4. Claims 19-20 are not limited to tangible embodiments. In view of Applicant's disclosure, specification page 15, lines 16-25, the medium is not limited to tangible embodiments, instead being defined as including both tangible embodiments (e.g., recordable-type media, such as a floppy disk, a hard disk drive, a RAM, CD-ROMs, DVD-ROMs) and intangible embodiments (e.g., transmission-type media, such as digital and analog communications links, wired or wireless communications links using transmission forms, such as, for example, radio frequency and light wave transmissions). As such, the claims are not limited to statutory subject matter and are therefore non-statutory.

Office Action dated July 17, 2006, page 2.

The Examiner asserts that claims 19 and 20 are not limited to tangible embodiments. No basis is present, however, for holding a computer usable medium claim non-statutory because the medium may be allegedly "intangible." The MPEP states:

In this context, "functional descriptive material" consists of **data structures** and computer programs **which impart functionality when employed as a computer component**. (The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement of data.

When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the

function of the descriptive material to be realized. Compare *In re Lowry*, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) (claim to data structure stored on a computer readable medium that increases computer efficiency held statutory) and *Warmerdam*, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure stored in memory held statutory product-by-process claim) with *Warmerdam*, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure *per se* held nonstatutory). (**emphasis added**)

MPEP 2106 (IV)(B)(1).

Claims 19-20 recite clearly functional descriptive material since they impart functionality when employed as a computer component. Moreover, the functional descriptive material of claims 19-20 is recorded on “some” computer-readable medium.

In the above context, the term “some” means “any” computer-readable medium. The MPEP does not draw any distinctions between one type of media that is considered to be statutory and another type of media that is considered to be non-statutory. To the contrary, the MPEP clearly states that as long as the functional descriptive material is in “some” computer-readable medium, it should be considered statutory. The only exceptions to this statement in the MPEP are functional descriptive material that does not generate a useful, concrete and tangible result, e.g., functional descriptive material composed completely of pure mathematical concepts that provide no practical result. Claims 19-20 clearly recite a useful, concrete and tangible result in that time relative information in a cache notification event is adjusted based on a clock delta. This is not just some disembodied mathematical concept or abstract idea.

Thus, claims 19-20 are directed to functional descriptive material that provides a useful, concrete and tangible result, and which is embodied on “some” computer-readable medium. Therefore, claims 19-20 are statutory and the rejection of the claims under 35 U.S.C. § 101 has been overcome.

II. 35 U.S.C. § 103, Obviousness: Claims 1-20

The Examiner has rejected claims 1-20 under 35 U.S.C. § 103(a) as being unpatentable over Applicant Admitted Prior Art (hereinafter “AAPA”) in view of Vangen (U.S. Patent No. 4,337,463). This rejection is respectfully traversed.

In rejecting the claims, the Examiner states:

8. As per claims 1, 7, 13 and 19, AAPA discloses that in a distributed caching environment, notification events are passed between member servers to synchronize cache entries within the managed cluster’s domain. Further, AAPA discloses how if the clocks in the member servers are not synchronized, an incoming event may be unexpectedly discarded. AAPA provides some examples to solve the problems [page 2, line 5 -- page 3, line 2].

AAPA does not disclose if time relative information can be utilized between two member servers to synchronize the clocks between them. However, Vangen clearly

discloses an invention relating to a time synchronization transmitter-receiver system to be used between two stations in any system in which the actual time of events needs to be known [col. 3, line 42 -- col. 4, line 30]. Vangen expressly discloses how the clock delta can be used to adjust time information to allow for the transmission time from one station to another station thus allowing the clocks to be synchronized to a time [col. 4, lines 13-30]. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the cited references as both are directed to time synchronization between two stations or servers. Moreover, Vangen clearly discloses that the invention can be utilized in any system. Thus, the problem of the time synchronization between the member servers as disclosed by AAPA can easily be solved by Vangen disclosed time synchronization system.

Office Action dated July 17, 2006, pages 3-4.

Claim 1, as amended herein, is as follows:

1. A method for managing a cache in a distributed caching environment, the method comprising:
 - receiving a cache notification event from a sending device, wherein the cache notification event includes time relative information and a clock value for the sending device;
 - determining a clock delta by determining a difference between a local clock and the clock value for the sending device; and
 - adjusting the time relative information in the cache notification event based upon the clock delta.

Applicants respectfully submit that neither AAPA nor Vangen, nor their combination, discloses or suggests “receiving a cache notification event from a sending device, wherein the cache notification event includes time relative information and a clock value for the sending device” and “adjusting the time relative information in the cache notification event based upon the clock delta” as recited in claim 1, and that claim 1 patentably distinguishes over the references in its present form.

The present invention is directed to managing a cache in a distributed caching environment. As recognized by the Examiner, AAPA discloses that when clocks in servers in a distributed caching environment are not synchronized, a problem exists that cache notification events received from a server may be unexpectedly discarded or retained longer than expected. AAPA, however, does not disclose or suggest “receiving a cache notification event from a sending device, wherein the cache notification event includes time relative information and a clock value for the sending device” as recited in claim 1 (emphasis added), nor does it disclose any of the other steps recited in claim 1.

Vangen, on the other hand, is directed to a mechanism for time synchronization between a master station and a remote station in which the actual time of events needs to be known (see col. 1, lines 6-9).

Vangen is directed primarily to the utility industry, and, more particularly, to an electric utility wherein a remote substation is periodically updated with the actual time of day reading “so that the remote station clock will accurately record the time of day of electric meter readings” (col. 1, lines 14-19).

In rejecting the claims, the Examiner refers specifically to col. 4, lines 13-30 of Vangen as disclosing the subject matter of claim 1. Col. 4, lines 9-29 of Vangen is as follows:

Similarly, the remote station can transmit its remote time clock information to the master station. Referring again to FIG. 1, time information received from the remote clock is placed in the remote time register 26. The difference between the remote time and the actual master time is computed by summation device 30 and the time difference is placed in time difference register 28. This time difference is equal to the sum of the master station to remote station and the remote station to master station transmission times. This time difference is divided by two and entered into the offset register 14. In future time transmissions from the master station to the remote station this offset time from the offset register 14 is summed by summation device 16 with the master time from register 12 as it is entered into the holding register 18. This offset or adjusted time information to allow for the transmission time from the master station to the remote station thus allows the clock in the remote station to be synchronized to a time so that the remote station clock will agree exactly with the master station clock.

As described in the above paragraph, in Vangen, time information from a remote station is received at the master station, and the difference between the remote time and the actual master time is computed. The computed time difference is actually the sum of the transmission times from the master station to the remote station and from the remote station to the master station. The time difference is thus divided by two and stored in an offset register as an offset time. In future time transmissions, the master time is summed with this offset time to allow the clock in the remote station to agree exactly with the master station clock.

Nowhere in the above recitation or elsewhere in the reference does Vangen disclose or suggest receiving a notification event from a sending device that includes both time relative information and a clock value for the sending device. In Vangen, any notification event that may be received does not include both time relative information and a clock value for a sending device. Therefore, Vangen also does not disclose or suggest “receiving a cache notification event from a sending device, wherein the cache notification event includes time relative information and a clock value for the sending device” as recited in claim 1.

Vangen also fails to disclose or suggest “adjusting the time relative information in the cache notification event based upon the clock delta” as required by claim 1. In Vangen, it appears that the adjusted time information or “offset time” allows a clock in a remote station to be adjusted, however, there is no adjustment of time relevant information in the notification event based on a clock delta as recited in claim 1.

Inasmuch as neither AAPA nor Vangen discloses or suggests “receiving a cache notification event from a sending device, wherein the cache notification event includes time relative information and a clock value for the sending device” and “adjusting the time relative information in the cache notification event based upon the clock delta” as recited in claim 1, the combination of AAPA and Vangen also does not teach or suggest the method recited in claim 1. Claim 1, accordingly, is not obvious over AAPA in view of Vangen, and patentably distinguishes over the references in its present form.

Claims 2-6 depend from and further restrict claim 1 and are also not obvious over AAPA in view of Vangen, at least by virtue of their dependency. In addition, many of these claims recite further subject matter that is neither disclosed nor suggested by the cited art. For example, claim 2 depends from claim 1 and recites the step of validating a cache notification event; and claim 3 depends from claim 2 and recites discarding the cache notification event if the cache notification event is invalid. The Examiner refers generally to page 1, line 26 to page 3, line 24 of AAPA as disclosing the subject matter of these claims; however, Applicants are unable to identify any specific reference to validating a cache notification event or discarding an invalid cache notification event in AAPA.

Independent claims 7, 13 and 19 recite similar subject matter as claim 1 and are not obvious over AAPA in view of Vangen for similar reasons as discussed above with respect to claim 1. Claims 8-12, 14-18 and 20 depend from and further restrict one of independent claims 7, 13 and 19 and also patentably distinguish over the references, at least by virtue of their dependency and for reasons discussed above with respect to claims 2 and 3.

Therefore, the rejection of claims 1-20 under 35 U.S.C. § 103 has been overcome.

III. Conclusion

For at least all the above reasons, it is submitted that claims 1-20 are patentable over AAPA in view of Vangen and that this application is now in condition for allowance. It is, accordingly, respectfully requested that the Examiner so find and issue a Notice of Allowance in due course.

The Examiner is invited to call the undersigned at the below-listed telephone number if in the opinion of the Examiner such a telephone conference would expedite or aid the prosecution and examination of this application.

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Respectfully submitted,

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